

### **REMARKS**

This is in response to the Office Action mailed on June 26, 2006, and the references cited therewith.

Claims 31-33 have been added. No claims are amended. Claims 1-28 and 30-33 are now pending in this application.

#### **§101 Rejection of the Claims**

Claims 1-28 and 30 were rejected under 35 USC § 101, because the methods recited in the claimed invention do not produce real life, real world, useful, concrete, and tangible results. This rejection is respectfully traversed.

The Office Action on page 2 recites some law, but fails to apply the law to the claims. There is no mention of the claims in the analysis, and thus nothing for Applicant to argue against. Pursuant to MPEP 2106 II A, "Office personnel have the burden to establish a prima facie case that the claimed invention as a whole is directed to solely an abstract idea or to manipulation of abstract ideas or does not produce a useful result. Only when the claim is devoid of any limitation to a practical application in the technological arts should it be rejected under 35 U.S.C. 101." No prima facie case has been established by the mere allegation that claims 1-28 and 30 "recited in the claimed invention do not produce a real life, real world, useful, concrete, and tangible result." Therefore, a prima facie case has not been made out, and the rejection should be withdrawn. Further, if a next action relies on the same rejection, it should not be made final because applicant has not been afforded a fair opportunity to address the issues.

Nevertheless, the Examiner appears to be indicating that Applicant is trying to claim merely an idea or a concept, such as an abstract idea. For instance, the Office Action cites *O'Reilly v. Morse*, 56 U.S. (15 How.) 62, 113-114 (1853) as standing for the fact that the abstract idea of electromagnetism or steam power is not patentable. Applicant points out that in *O'Reilly*, the use of electromagnetism to produce distinguishable signs for telegraphy was found to be patentable as more than merely an abstract idea.

The present claims are not merely an abstract idea, and in fact clearly establish a practical application. Essentially, they involve the use of sensors to monitor a process, and then evaluating sensor data to identify if an event is occurring. This information is extremely useful for an operator of a process. Once the operators knows what event is occurring, the operator is able to control the process better, or even decide to shut it down.

Identifying an event that is occurring in a process is every bit as real world, real life, useful, concrete and tangible a result as the result in State Street of a final share price:

"transformation of data representing discreet dollar amounts, by a machine through a series of mathematical calculations into a final share price, constitutes a practical application of a mathematical algorithm, formula, or calculation, because it produces **"a useful, concrete and tangible result"** - a final share price momentarily fixed for recording... " State Street Bank, 149 F.3d 1368 (1998).

Identifying an event that is occurring in a process is a real world result that can be used to determine how to control the process. Compared to the State Street real world result of a final share price, the identification of an event is much more real world. It can save lives by providing crucial information about the process that may be used to prevent a catastrophic event. Knowing a final share price may be desired to determine whether you have enough money for retirement or can go on a vacation, but it pales in comparison to obtaining valuable information from sensors monitoring a process by using calculations that are more complex than those used in State Street.

The spectrum of what is abstract to what is real world is a difficult thing to navigate. However, there are some easy calls along the way. Perhaps the broad abstract concept of the claims is "finding events in a process". This broad statement is clearly too abstract for patent protection, as nothing indicates how that is done. Claim 1 carries that concept far into the real world realm. It applies a specific PCA model on sensor data from the process. It creates statistics related to the model, determines if an event is occurring, and then finds a nearest cluster of bad actors related to the event to identify the event. Thus, claim 1 is not just a recitation of an abstract idea, but rather the recitation of a real world process that is clearly a practical application and provides a useful, tangible and concrete result.

As noted in the Guidelines for examination, “If the examiner determines that the claim does not entail the transformation of an article, then the examiner shall review the claim to determine if the claim provides a practical application that produces a useful, tangible and concrete result. In determining whether the claim is for a ‘practical application,’ **the focus is not on whether the steps taken to achieve a particular result are useful, tangible and concrete, but rather that the final result achieved by the claimed invention is ‘useful, tangible and concrete.’**” AT&T, 172 F.3d at 1358-59, 50 USPQ2d at 1452. *Interim Guidelines for Examination of Patent Applications for Patent Subject Matter Eligibility* (hereinafter, the “Guidelines”), pg. 20, October 2005. (emphasis added). Applicant has clearly shown that claim 1 does provide such a useful, tangible and concrete final result.

Claims 2-15 depend from claim 1, and add further elements that push them even further into the real world of practical applications. Applicant reserves the right to describe them in further detail should it be deemed necessary.

Claim 16 is written in means plus function language, meaning that the elements should be interpreted to cover those structures described in the detailed description that accomplish the recited functions. Since such claims are clearly authorized by statute, it is unclear how the entire specification is being declared non-statutory. It is also believed statutory for at least the same reasons as claim 1, since similar function is recited. Claims 17-28 depend from claim 16 and are believed statutory for at least the same reasons.

Claim 30 is also a method claim that recites elements that are similar to claim 1, and thus are believed statutory for at least the same reasons.

#### §102 Rejection of the Claims

Claims 1-28 and 30 were rejected under 35 USC § 102(e) as being anticipated by Qin et al. (U.S. Patent No. 6,594,620). This rejection is respectfully traversed. Applicant reserves the right to swear behind Qin et al., at a later date.

All claim limitations must be met by the art to establish a prima facie case of anticipation. The current claim elements make it clear that events in a process are being found. The Response to Arguments section of the Office Action indicates that claims are to be given their broadest interpretation consistent with the specification. It appears that the Office Action is defining the

term “process” in accordance with Merriam Webster dictionary as: “a series of actions or operations conducing to an end”, and the term “event” as something that happens”, an occurrence.”

First, the term “process” must mean something different than the definition used in the Office Action because the “process” is being monitored by sensors that provide sensor data. In the context of such a process, the word “event” takes on a special meaning, and refers to something that happens to the process, not to a sensor monitoring the process. The first element describes using sensor data from the process in a model, and the remaining elements describe using the model to determine if events are occurring. Thus, events are clearly related to the process.

Independent claim 16 is written in means plus function format, which means that the structure described in the specification that accomplishes that function, plus reasonable equivalents should be how the claim is interpreted. The specification describes that events in a process are identified. Thus, claim 16 clearly contains the differences over the prior art that were mentioned by the Examiner.

Independent claim 30 even recites that a process event is identified in the last element. Thus, it also contains the difference noted by the Examiner. The Office action indicates that Qin et al., describes finding a nearest cluster of bad actors related to the process event to identify the process event as claimed at Col. 3, lines 10-13. These lines “determine whether a detection alarm is due to one or more faulty sensors...” and uses “a series of detectors are constructed which are insensitive to one subset of faults but most sensitive to the others” to identify the offending sensor. This language clearly does not relate to an event in a process, but appears to refer to finding structured residuals that are not sensitive to one set of faults but more sensitive to others. This is an entirely different approach to a very different problem. It should be noted that the present application refers to events as process parameters being out of range in one or more parts of the process. The claim 30 is not directed specifically at identifying a bad sensor, but rather identifying an event in the process, as clearly recited in the elements of the claim.

Claim 30 further recites that events are determined as occurring “as a function of one or more process states being outside of normal range”. This element even more clearly distinguishes Qin et al., as it specifically refers to process states, not to sensors that are

malfunctioning. Since a prima facie case of anticipation has not been established the rejection should be withdrawn.

With respect to the current rejections of the claims, the presently claimed invention is directed at “identifying events in a process”. These are very different purposes as compared to identifying faults occurring in sensors, and the claims are believed to clearly distinguish the reference.

Claim 1 recites “determining if an event is occurring”. This event is related to the process, not specifically to identifying a bad sensor as in Qin et al. The Office Action indicates this element is in Qin et al., at Col. 3, lines 10-13. These lines “determine whether a detection alarm is due to one or more faulty sensors,...” and uses “a series of detectors are constructed which are insensitive to one subset of faults but most sensitive to the others” to identify the offending sensor. This language clearly does not relate to an event in a process, but appears to refer to finding structured residuals that are not sensitive to one set of faults but more sensitive to others. This is an entirely different approach to a very different problem. It should be noted that the present application refers to events as process parameters being out of range in one or more parts of the process. The present claims are not directed specifically at identifying a bad sensor, but rather identifying an event in the process as stated in the preamble of each independent claim.

Claim 1 also recites “finding a nearest cluster of bad actors related to the event to identify the event.” The Office Action sites the same section of Qin et al., at Col. 3, lines 10-13 as describing this element. As seen from the above quoted language, it does not describe finding a cluster of bad actors related to a process event, but instead finds structured residuals to identify an offending sensor. Thus, Qin et al., is lacking at least two elements of independent claims 1 and 16.

Dependent claim 2 recites that clusters of bad actors are compared to known clusters in a library of clusters for bad actors. As known from claim 1, these clusters are related to process events. No such clusters are found in the language referenced in the Office Action, Qin et al., Col. 2, lines 60-63. Such language clearly refers to optimizing the reconstruction of faulty sensor values, not identifying events occurring in the process. As such, the element is not taught by Qin et al., and the rejection should be withdrawn.

Dependent claims 3-5 refer to sequences of cluster matches. The Office Action refers to Col. 6, lines 29-41 as describing this element. However, this language only refers to calculating diagnostic information as to the type of sensor fault. It does not deal with events in a process as claimed, and any time sequences are related to a sensor, not to sequences of clusters of bad actors as claimed. The Office Action also indicated that claim 4 is shown at Col. 19, lines 1-2 which recite: "Goodness of fit of the regression line is determined by the linear correlation coefficient exceeding a specified threshold." Applicant fails to see how this language shows or suggests claim 4, which recites "determining if a cluster needs to be split when new bad actors are added; and splitting the cluster into two clusters using a goodness of fit algorithm." The only correlation is the use of goodness of fit algorithm, but the algorithm is used in very different manners. The language of Qin et al., clearly does not anticipate claim 4. Also, the reference to Qin et al., with respect to claim 5 does not appear to anticipate. Claim 5 refers to determining if new event categories are encountered and broadening limits for a sequence of clusters. Col. 5, lines 30-41 simply refers to calculating residuals and residual transforms. There is no discussion in the Office Action of how this seemingly unrelated language teaches any part of claim 5.

Similarly, language cited in Qin et al., with respect to claims 6-15 also appear to have little to do with the claimed invention since Qin et al., is directed to detecting faulty sensors, and not events in a process as claimed. Claims 17-28 which depend from claim 16, are similar to claims that depend from claim 1, and distinguish the reference for at least the same reasons.

As Qin et al., does is lacking one or more elements of the claims, a proper prima facie case of anticipation has not been established, and the rejections should be withdrawn.

New claim 31 has been added, and provides a more clear definition of the term "event", as consisting of one or more process parameters being out of a normal range in one or more parts of the process. The process parameters are described in an earlier element with respect to the "sensor data representative of multiple process parameters in the process". A sensor fault is clearly not an event in this claim, as it is not a process parameter.

New claim 32 indicates that multiple process parameters are out of normal range.

New claim 33 indicates that one or more process parameter are measured by multiple sensors.

Conclusion

Applicant respectfully submits that the claims are in condition for allowance, and notification to that effect is earnestly requested. The Examiner is invited to telephone Applicant's attorney at (612) 373-6972 to facilitate prosecution of this application.

If necessary, please charge any additional fees or credit overpayment to Deposit Account No. 19-0743.

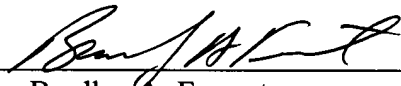
Respectfully submitted,

VALERIE GURALNIK ET AL.

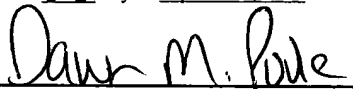
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